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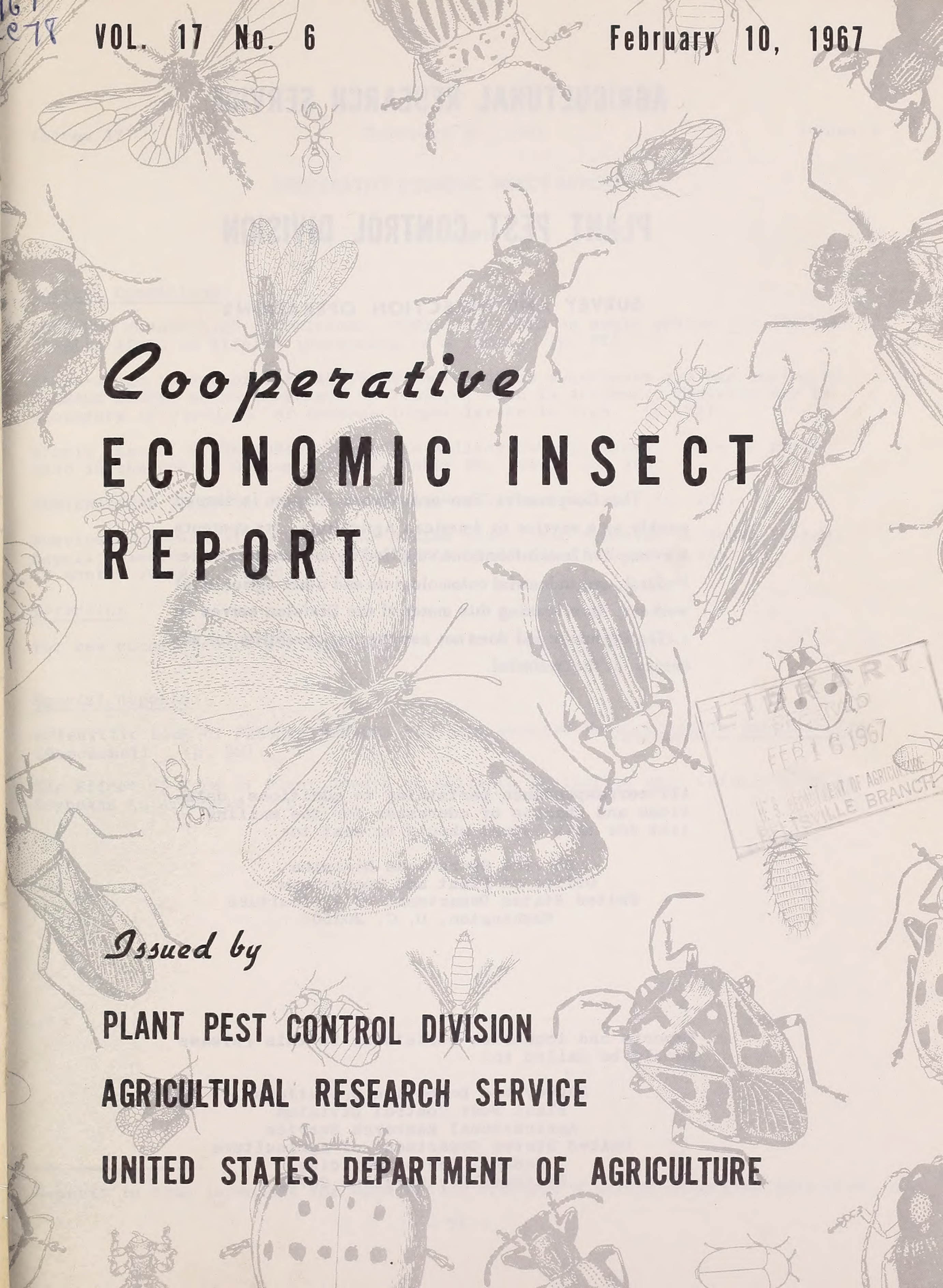

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
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SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 17 February 10, 1967 Number 6

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG counts high in Oklahoma. CORN LEAF APHID on small grains and SPOTTED ALFALFA APHID on alfalfa increasing in Arizona. (p. 77).

First-stage larvae of BEET ARMYWORM increased on sugarbeets and egg laying by CABBAGE LOOPER moths increased on lettuce, both in Arizona. Controls may be necessary if survival of cabbage looper larvae is high. (p. 78).

Single case of SCREW-WORM reported in Willacy County, Texas. This is first case in the United States since December 29, 1966. (p. 79).

SUBTERRANEAN TERMITES reported swarming in several areas. (p. 80).

Heaviest outbreak of COCONUT LEAF ROLLER since 1945 reported on Kauai Island, Hawaii; damage extensive. GIANT AFRICAN SNAIL taken for first time in 13 months on same island. (p.82).

Detection

For new county record see page 81.

Special Reports

Scientific name of PARSNIP WEBWORM has been changed to *Depressaria pastinacella* (Duponchel). (p. 82).

The Effect of Type of Plant Growth on Bollworm (*Heliothis zea*) Infestations in Soybeans in Arkansas. (p. 83).

Reports in this issue are for week ending February 3 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING FEBRUARY 6, 1967

HIGHLIGHTS: The third major storm in 2 weeks hit the northern Great Plains and the Great Lakes region. Temperatures averaged above normal over most of the Nation.

PRECIPITATION: The third major snowstorm in 2 weeks dumped several inches of snow over portions of the northern Great Plains and eastward to New England. Chicago, Illinois, was especially hard hit when 6-9 inches of new snow brought the 11-day total to 3 feet, a record for that city; this is more snow than usually falls at Chicago in an entire season. Strong winds piled the snow in drifts 12-15 feet deep. Snowfall totals of 6-12 inches were common from Chicago eastward to southern Maine. The precipitation that has persisted over the Far Northwest tapered off somewhat after dumping up to 7 inches of rain along portions of the Washington coast; snow fell in the higher elevations and eastward to the Rockies. At week's end, a storm centered over the Southeast was spreading snow from Birmingham, Alabama, to Philadelphia, Pennsylvania, with heavy thundershowers and rains reported along the southern Atlantic coast. Areas which received only light precipitation during the week include the Far Southwest, the southern Rocky Mountains, the western Great Plains (from eastern Montana and the Dakotas to the Rio Grande), and the Florida Peninsula.

TEMPERATURE: Mild weather continued for the fifth consecutive week in the Far Northwest; elsewhere west the Rockies, it was the fourth mild week. Above normal temperatures have been the rule in southern Florida for the past 5 weeks. Temperatures averaged slightly below normal from Lower Michigan to northern New England. Subzero temperatures occurred on 1 or 2 mornings from northeastern Montana to northern New England and as far south as the northern portions of Nebraska and Iowa. On Saturday, Chinook winds blowing down the eastern slope of the Rockies pushed the temperatures into the 50's and 60's. On Thursday, southerly winds in the East produced 70° temperatures east of the Appalachians as far north as Washington, D. C. (Summary supplied by Environmental Data Service, ESSA).

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (Schizaphis graminum) - OKLAHOMA - Counts high, 10-40 per linear foot, on wheat in Jackson County; 0-8 per linear foot in Logan, Oklahoma, Payne and Garfield Counties. (Okla. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Although present in small number of fields, existing populations increasing in alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Increasing in most small grains in Yuma, Maricopa and Pinal Counties. Continued warm temperatures could result in economic population. (Ariz. Coop. Sur.). NEW MEXICO - Light on wheat in Lovington, Lea County. (Mathews).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Light on wheat in Oklahoma and Logan Counties. (Okla. Coop. Sur.).

CORN, SORGHUM, SUGARCANE

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Larvae infested 50 percent of dry cornstalks in Washita County field. (Okla. Coop. Sur.).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - OKLAHOMA - Ranged 1-18 per linear foot in 50 percent of wheat in central and north-central areas. (Okla. Coop. Sur.). MISSISSIPPI - Very light on wheat in Chickasaw County. (Dinkins). FLORIDA - Adults and nymphs totaled 75 per 100 sweeps in 8-inch oats at Gainesville, Alachua County. (Mead).

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Ranged 5-25 per linear foot on wheat in Tillman County. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - MISSISSIPPI - Approximately 90-100 larvae per square foot causing very severe leaf damage in Pontotoc County field. (Dinkins). VIRGINIA - Eggs hatching in Rockbridge County due to unseasonably warm weather. (Woodside, Jan. 25).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Light larval numbers appearing in alfalfa in Yuma and Maricopa Counties. Populations lighter than at this time last year. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - ALABAMA - Isolated larval populations, probably this species, feeding heavily on burclover and to lesser extent on crimson clover in central area counties. Damage usually not severe, but ragging of leaves apparently earlier and more pronounced than most years. May be due to several weeks of mild weather. (McQueen).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Populations becoming more widespread throughout Maricopa County and areas of Yuma County; however, populations increasing very slowly for this time of year. (Ariz. Coop. Sur.). NEW MEXICO - Light to medium on alfalfa in Eddy and Chaves Counties. (Mathews). MISSISSIPPI - Adults and nymphs moderate on vetch in Pontotoc County. (Dinkins).

GREEN CLOVERWORM (Plathypena scabra) - ALABAMA - Moths emerging from hibernation and swarming at Limestone County location. Moths have been noticeable throughout State during winter. No egg laying observed. (Morrow et al.).

SUGARBEETS

BEET ARMYWORM (*Spodoptera exigua*) - ARIZONA - Increased numbers of first-stage larvae observed on sugarbeets in Mesa and Chandler areas, Maricopa County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (*Myzus persicae*) - Continues light on sugarbeets in Maricopa County (Ariz. Coop. Sur.).

COLE CROPS

DIAMONDBACK MOTH (*Plutella xylostella*) - FLORIDA - Total of 60 larvae and 11 adults taken in 100 sweeps of rape at Gainesville, Alachua County. (Mead).

GREEN PEACH APHID (*Myzus persicae*) - FLORIDA - Total of 14 taken in 100 sweeps of rape at Gainesville, Alachua County. (Mead).

GENERAL VEGETABLES

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - Egg laying increasing on lettuce in Yuma and Maricopa Counties. Controls may be necessary if larval survival high after eggs hatch. (Ariz. Coop. Sur.). TEXAS - Larvae a problem on several vegetable crops in lower Rio Grande Valley. (Parker).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Moderate populations migrated to spring lettuce in Yuma County; controls required. (Ariz. Coop. Sur.).

DECIDUOUS FRUITS AND NUTS

WALNUT HUSK FLY (*Rhagoletis completa*) - WASHINGTON - Larvae recovered from walnut husk in Clark County October 28, 1966. This is new county record. (Shanks).

CITRUS

CITRUS RED MITE (*Panonychus citri*) - FLORIDA - Moderate to severe on 95 percent of 6,000 sweet orange nursery plants at Bereah, Polk County. (Schmidt, Jan 24).

TEXAS CITRUS MITE (*Eutetranychus banksi*) - FLORIDA - Heavy on 85 percent of 10,000 citrus nursery plants at Springhead, Hillsborough County. (Vaughan, Jan 9).

COTTONY-CUSHION SCALE (*Icerya purchasi*) - CALIFORNIA - Medium on citrus trees in Nipomo, San Luis Obispo County. (Cal. Coop. Rpt.).

LONG-TAILED MEALYBUG (*Pseudococcus adonidum*) - CALIFORNIA - Medium on citrus trees in Nipomo, San Luis Obispo County. (Cal. Coop. Rpt.).

SMALL FRUITS

GRAPE SCALE (*Aspidiotus uvae*) - VIRGINIA - Heavy on grapevines in Arlington County. Det. by M. Kosztarab. (Isakson).

ORNAMENTALS

APHIDS - CALIFORNIA - *Myzocallis arundinariae* medium on bamboo nursery stock in San Diego County. (Cal. Coop. Rpt.). NEW MEXICO - *Cinara* sp. light to heavy on ponderosa and pinyon pines in Albuquerque, Bernalillo County. (Heninger).

ALABAMA - Large numbers of *Aphis spiraecola* eggs and some hatching noted on spirea in central and southern areas. Light to medium numbers of aphids feeding on leaves and some blossoms developing as result of extended mild weather. Eggs heavy on stems and branches of these ornamentals. (McQueen).

HEMISPHERICAL SCALE (*Saissetia coffeae*) - CALIFORNIA - Heavy on nursery palms in Chico, Butte County. (Cal. Coop. Rpt.).

MEALYBUGS - CALFIORNIA - *Chorizococcus lounsburyi* medium on agapanthus lily nursery stock in Menlo Park, San Mateo County; host plant currently popular as landscaping ornamental. *Trionymus diminutus* heavy on *Phormium* sp. nursery stock in Saratoga, Santa Clara County. (Cal. Coop. Rpt.).

FOREST AND SHADE TREES

PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) - NEW MEXICO - Light to heavy on ornamental plantings of ponderosa and pinyon pines in Bernalillo County. (Heninger, Kloepfer). CALIFORNIA - Medium on pine trees in Escondido, San Diego County. This scale insect has been very prevalent past year in many areas. (Cal. Coop. Rpt.).

A MARGARODID SCALE (*Matsucoccus* sp.) - CALIFORNIA - Medium on pine trees in Black Butte and Mount Shasta area, Siskiyou County, and on Monterey pine in Holy City area, Santa Cruz County. (Cal. Coop. Rpt.).

GIANT BARK APHID (*Longistigma caryae*) - ALABAMA - Large number of wingless females noted at location in Decatur, Morgan County; apparently leaving hibernation and seeking food source. This aphid heavy on oak trees at this location last year. (Rutledge).

TERMITES - CALIFORNIA - *Zootermopsis* sp. and *Reticulitermes* sp. medium in eucalyptus trees on Yerba Buena Island, San Francisco County. Termite infestations in trees and plants becoming more and more common. (Cal. Coop. Rpt.).

MAN AND ANIMALS

COMMON CATTLE GRUB (*Hypoderma lineatum*) - IOWA - Third to fifth-stage larvae light (averaged 10 per hide) at Montezuma, Poweshiek County. Past history of animals unknown. Fourth and fifth-stage larvae moderate (averaged 14 per hide) at Marengo locker plant, Iowa County. These animals purchased from sale barns and livestock brokers several months earlier. (Iowa Ins. Sur.). KANSAS - Ranged 0-20 per head on cows and 0-17 per head on steers in Lyon County. Statewide cattle grub survey underway. (Simpson, Jan. 27). OKLAHOMA - Counts per head ranged 8-12 in Stephens County, 3-5 in Garvin County; moderate in Mayes County. (Okla. Coop. Sur.). ARKANSAS - Ranged 2-5 per animal in 8 percent of cattle in 2 treated herds in Craighead County. Ranged 8-12 per animal in 35 percent of untreated cattle in same county. (Roberts).

SCREW-WORM (*Cochliomyia hominivorax*) - Single case reported in U.S. January 29-February 4 was in Willacy County, Texas. Total of 56 cases reported in portion of Barrier Zone in Republic of Mexico January 22-28 as follows: Territorio sur de Baja California 13, Sonora 26, Chihuahua 7, Nuevo Leon 3, Tamaulipas 7. Barrier Zone is area where eradication operations are underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released January 29 - February 4: Texas 22,008,000, Mexico 96,770,000. (Anim. Health Div.).

MOSQUITOES - LOUISIANA - Larval collections in Jefferson Parish contained *Aedes vexans*, *Anopheles quadrimaculatus*, *Culex restuans*, *Culex salinarius*, and *Culiseta inornata*. Mosquitoes averaged 2-8 per night in 21 light traps throughout parish, with *Aedes vexans* and *Aedes sollicitans* dominant. (Stokes).

FLORIDA - Collections from isolated pool in Gainesville area, Alachua County, contained *Culex territans*, *Culex restuans*, *Anopheles crucians* and *Culex salinarius*. (Mead). *Culex salinarius*, *Anopheles crucians* and *Anopheles quadrimaculatus* adults annoying about homes in unspecified suburban area; *A. quadrimaculatus* least abundant. (Mercer).

CATTLE LICE - IOWA - *Linognathus vituli* adults light (less than 5 per examination area) on all animals checked in Poweshiek and Iowa Counties. *Solenopotes capillatus* adults light on all cattle examined in Montezuma area of Poweskiek County and Morengo area of Iowa County; *Bovicola bovis* adults averaged less than 10 per examination in these same areas. ARKANSAS - *S. capillatus* light around eyes and on necks of 2 percent of cattle in 2 treated herds in Craighead County. (Roberts). UTAH - Unspecified species abundant on beef cattle in area of Kane County. (Knowlton).

HOG LOUSE (*Haematopinus suis*) - IOWA - None found on hogs from 3 farms in Poweshiek and Iowa Counties, or on hogs from 19 farms checked in January 1967. (Iowa Ins. Sur.). OKLAHOMA - Moderate on hogs in Mayes County, moderate to heavy in Garvin County. (Okla. Coop. Sur.). ALABAMA - Extremely heavy on market-size animal in Elmore County. (Bayles).

WINTER TICK (*Dermacentor albipictus*) - OKLAHOMA - Nymphs and adults continue heavy on horses in Cherokee County; moderate on cattle in Adair County. (Okla. Coop. Sur.).

AN ACARID MITE (*Caloglyphus mycophagus*) - CALIFORNIA - Nymphs and adults heavy in earthworm bed in El Modena, Orange County. (Cal. Coop. Rpt.).

HOUSEHOLDS AND STRUCTURES

SUBTERRANEAN TERMITES (*Reticulitermes* spp.) - OKLAHOMA - Winged reproductives swarming in a location in Payne County. (Okla. Coop. Sur., Jan. 29). ALABAMA - *R. hageni* winged forms emerged in Dallas County. Det. by T. E. Synder. (Hess) FLORIDA - *R. flavipes* reproductives observed in midday flights at University of Florida, Gainesville, Alachua County, January 23. (Hetrick). MARYLAND - *R. flavipes* swarmed inside home at College Park, Prince Georges County. (U. Md., Ent. Dept.).

AN EARWIG (*Labidura riparia*) - CALIFORNIA - Medium at residence in San Diego, San Diego County. This species is slowly extending its range and is more and more frequently invading residences. In some ways, these are worse than cockroaches due to the odor. (Cal. Coop. Rpt., Jan. 27).

A POWDER-POST BEETLE (*Dinoderus minutus*) - UTAH - Taken from Malawi baskets at Logan, Cache County, December 8, 1966. Det. by T. J. Spilman. Baskets originated in Africa. (Knowlton).

STORED PRODUCTS

A MEALWORM (*Alphitobius piceus*) - FLORIDA - Larvae and adults collected from rice in storage bin at Sebring, Highlands County. (Denmark).

BENEFICIAL INSECTS

LADY BEETLES - ALABAMA - Few *Adalia bipunctata* adults emerged from hibernation in central area and feeding on aphids in pine trees. Few *Psyllobora vigintimaculata* adults noted on magnolia, laurelcherry and other trees in central area. (McQueen).

A FLOWER BUG (*Orius insidiosus*) - MISSISSIPPI - Adults feeding on pea aphids in Pontotoc County. (Dinkins).

DAMSEL BUGS (*Nabis* spp.) - OKLAHOMA - Light on wheat in north central and central areas. Only predator commonly seen. (Okla. Coop. Sur.).

A BETHYLID WASP (*Cephalonomia tarsalis*) - WASHINGTON - Reared from saw-toothed grain beetle (*Oryzaephilus surinamensis*) at Yakima, Yakima County. (Powell).

A BRACONID (*Apanteles glomeratus*) - OKLAHOMA - Reared from southern cabbageworm (*Pieris protodice*) collected in Mayes County during September 1966. *A. glomeratus* det. by W. R. M. Mason. (Okla. Coop. Sur.)

FEDERAL & STATE PLANT PROTECTION PROGRAMS

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Small numbers of adults continue to be trapped in several central and southern counties. (Fla. Coop. Sur).

GRASSHOPPERS - OKLAHOMA - Egg pod counts per square foot in grassland averaged as follows: 0.25 at 16 locations in 4 northeastern counties, 0.75 at 11 locations in 3 southwestern counties, and 0.60 at 2 locations in one west-central county. Evidence of parasites and predators light in all areas. (Okla. Coop. Sur.).

KHAPRA BEETLE (*Trogoderma granarium*) - ARKANSAS - Survey of 14 properties in Hempstead, Hot Spring, Lafayette and Miller Counties negative. (Shotts, Jan. 20).

INSECT DETECTION

New County Record

WALNUT HUSK FLY (*Rhagoletis completa*) - WASHINGTON - Larvae recovered from walnut husk in Clark County. (p. 78).

CORRECTIONS

CEIR 17(4):41 - CATTLE LICE - IOWA - .... Solenoptes capillatus should read Solenopotes capillatus.

CEIR 17(5):60 - TURNIP APHID (Hydaphis pseudobrassicae) should read (Hyadaphis pseudobrassicae).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 1/31, BL - Black cutworm (*Agrotis ipsilon*) 1, granulate cutworm (*Feltia subterranea*) 3, armyworm (*Pseudaletia unipuncta*) 1. SOUTH CAROLINA - Charleston, 1/30-2/5, BL, temp 34-74°, precip. 0.01 inch - Armyworm 2, yellow-striped armyworm (*Prodenia ornithogalli*) 2, black cutworm 4, granulate cutworm 3. TEXAS - Brownsville, 1/21-27, 2 BL, temp. 42-80°, trace precip. - Black cutworm 117, salt-marsh caterpillar (*Estigmene acrea*) 1, granulate cutworm 52, tobacco budworm (*Heliothis virescens*) 1, corn earworm (*H. zea*) 10, variegated cutworm (*Peridroma saucia*) 22, yellow-striped armyworm 170, armyworm 118, beet armyworm (*Spodoptera exiqua*) 1, cabbage looper (*Trichoplusia ni*) 10.

HAWAII INSECT REPORT

Fruit, Nut, Forest and Shade Trees - Heaviest outbreak of COCONUT LEAF ROLLER (*Hedylepta blackburni*) since 1945 caused extensive damage along coastline in Wailua and Waipouli, Kauai. In Wailua, defoliation was heaviest in Lydgate Park (85-90 percent), golf course (75 percent) and Coco Palms Hotel (75 percent). Trees at Waipouli 50-75 percent defoliated. Outbreak appears to have been due to low temperature, rain and wind. (Au). CITRUS RUST MITE (*Phyllocoptruta oleivora*) severely damaged tangerines and oranges in Pahoa, Hawaii Island. Scars or russeting on fruits abundant. (Haramoto). FRUIT FLIES - Adult survey conducted from October to December 1966 over 10 square miles in Waiohinu, Hawaii Island, at 1,050 feet elevation. Counts per trap day averaged 368 *Dacus dorsalis*, 70 *D. cucurbitae* and 0.01 *Ceratitis capitata*; 40 traps used for each species. Infestation of *D. dorsalis* found in fruit of olivo tree (*Simarouba glauca*) in windbreak at the Waiakea Experimental Farm at Hilo, Hawaii Island. This is a new host record. Parasitism by *Opius oophilus*, a braconid egg parasite of *D. dorsalis*, was 85 percent. (Hawaii Fruit Fly Investigations) BLACK TWIG BORER (*Xylosandrus compactus*) heavy on *Rollinia emarginata* and light on Cleopatra Mandarin orange (*Citrus nobilis*), pondapple (*Annona glabra*), Spanish-plum (*Spondius purpurea*), mockorange (*Murraya paniculata*), white sapote (*Casimiroa edulis*) and *Inga paterno* at Waiakea Experimental Farm in Hilo, Hawaii Island. These are all confirmed new hosts. Heavy in log of swamp-mahogany (*Eucalyptus robusta*) in forest reserve, upper Manoa Valley on Oahu, January 24. (Hoshioka et al.). Larvae of a NOCTUID MOTH (*Polydesma umbricola*) light on young potted monkeypod trees at county nursery in Hilo, Hawaii Island. Foliar damage very noticable. (Davis).

Ornamentals - Adults of a FALSE SPIDER MITE (*Tenuipalpus pacificus*) medium on "Lawai" fern in Kalaheo, Kauai. Black markings on underside of leaves general following heavy feeding. (Au). All stages of a PLATASPID BUG (*Coptosoma xanthogramma*) heavy on maunaloa vines in Ewa, Oahu. This is first known report of this bug in Ewa. (Hironaka). Larvae of a GEOMETRID MOTH (*Anacamptoides fragilaria*) heavy on koa haole (*Leucaena leucocephala*) and light on slender mimosa and cheeseweed between Makua and Kaena Point on Oahu; light on rose plants at St. Louis Heights in Honolulu. Light on koa haole in early January in Waimea Valley on Kauai; no buildup occurred. (Davis et al.).

Beneficial Insects - Light adult numbers of a PTEROMALID WASP (*Anysis alcocki*) reared from barnacle scale (*Ceroplastes cirripediformis*) collected from Sand Island area of Oahu. This is first known recovery of this parasitic wasp, purposely introduced in 1964 from the Philippines to aid in control of wax scales. (Wong, Au).

Miscellaneous Pests - A live 3-inch GIANT AFRICAN SNAIL (*Achatina fulica*) collected in Poipu, Kauai. This is first specimen found on this island in 13 months. Baiting and inspection intensified. (Au).

Change in Scientific Name of Parsnip Webworm

This economically important moth, formerly known as *Depressaria heracliana* (L.) becomes *Depressaria pastinacella* (Duponchel), according to J. Bradley (Entomologist's Gazette 17(4):213-235, 1966). Because the type specimens of *heracliana* represent the species which has been called *Agonopterix applana* (F.), it was necessary to change the name. The name *pastinacella*, which is a junior synonym of *heracliana* of authors, becomes the valid name for the species.

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The Effect of Type of Plant Growth on Bollworm (Heliothis zea) Infestations in Soybeans in Arkansas[1]

W. P. Boyer[2]

Extensive survey of bollworm (Heliothis zea) in soybeans in Arkansas during the past several years shows that the type of plant growth has a marked effect on infestations. As previously reported (1965), survey for bollworm in soybeans has been conducted in Arkansas since 1960. In 1962 and 1965, data were recorded on several factors other than insects, including variety, planting date, plant height, attractiveness and type of canopy.

Attractiveness to insects as used here, refers to plant vigor, color, and absence of stress in plant growth. Type of canopy refers to open or closed, depending on whether the plants lapped in the row middles or there was open space in the middle.

Insect numbers presented in Tables 1 and 2 were determined by the plant-shaking method (1963). Fields, surveyed weekly from late July to early September, were grouped by variety of soybeans as there is wide difference in degree of infestation (1965). Fields within a variety were grouped according to the magnitude of the infestation as expressed by bollworms on 30 row feet. One count is recorded when bollworms were found in one weekly survey, but when in more than one weekly survey, the two highest consecutive weekly counts are shown.

The effect of type of canopy on bollworm infestations is shown by the data in Tables 1 and 2. Soybeans of the Hill variety have never been known to have bollworm infestations when the beans were planted at average planting dates.

Survey of 20 fields in 1965 showed results similar to what was found in 1962 regarding type of canopy and bollworm infestations. This is illustrated by data presented in Table 2. All fields with medium to heavy infestations had open canopies while most of the fields with zero to light infestations had closed canopies.

Bollworm infestations tend to correlate with late planting as shown by data in Tables 1 and 2. Type of canopy, however, outweighs late planting, plant vigor and plant height in its effect on bollworm infestations in soybeans.

The question naturally arises: Does closed canopy favor bollworm predators or is it unfavorable to moth activity and egg deposition? The difficulty of evaluating egg populations in soybeans due to heavy foliage discourages study of egg deposition.

An attempt was made in 1965 to determine the effect of type of canopy on predators. Predator counts were taken while surveying by the plant-shaking method in 20 fields in four counties. Big-eyed bugs (Geocoris spp.) and nabids (Nabis spp.) were the only predators of importance present. Results are presented in Table 3 with bugs of both genera combined.

The data are quite clear regarding the effect of type of canopy on bollworm in soybeans but the reasons need further investigation. One method is the use of sugar bait sprays to determine moth numbers and activity in fields with open and closed canopies.

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[1] Published with the approval of the Director, Agricultural Experiment Station.

[2] Survey Entomologist, University of Arkansas

Table 1. Soybean Field Survey in Arkansas, 1962.

Field	Variety	Bollworm	Planting Date	Attractiveness	Plant Height	Type of Canopy
Arkansas Co. No. 5	Hill	0	Average	Average	Average	Open
Desha Co. No. 4	Hill	0	Average	Average	Average	Open
Arkansas Co. No. 7	Jackson	0	Late	Attractive	Average	Open
Desha Co No. 9	Jackson	0	Late	Very Attractive	Rank	Closed
Chicot Co. No. 1	Jackson	5	Average	Average	Average	Open
Jeff. Co. No. 15	Jackson	3	Late	Attractive	Rank	Closed
Desha Co. No. 8	Jackson	7-2	Late	Attractive	Average	Open
Lincoln Co. No. 1	Jackson	32-10	Very late	Attractive	Average	Open
Arkansas Co. No. 1	Lee	0	Average	Average	Average	Closed
Arkansas Co. No. 2	Lee	0	Average	Average	Average	Closed
Arkansas Co. No. 6	Lee	0	Average	Average	Average	Closed
Desha Co. No. 1	Lee	0	Average	Average	Average	Closed
Desha Co. No. 3	Lee	0	Average	Average	Rank	Closed
Jeff. Co. No. 8A	Lee	0	Early	Average	Rank	Open
Arkansas Co. No. 4	Lee	3	Late	Average	Short	Open
Desha Co. No. 7	Lee	1-1	Average	Average	Average	Open
Jeff. Co. No. 4	Lee	2	Average	Average	Average	Closed
Jeff. Co. No. 5	Lee	2-1	Average	Average	Average	Closed
Jeff. Co. No. 6	Lee	1-1	Average	Average	Average	Closed
Jeff. Co. No. 7	Lee	1	Late	Average	Average	Closed
Jeff. Co. No. 8	Lee	1	Early	Average	Average	Open
Jeff. Co. No. 9	Lee	3-2	Late	Average	Average	Open
Jeff. Co. No. 11	Lee	3-1	Late	Average	Average	Open
Chicot Co. No. 4	Lee	6	Average	Average	Average	Open
Desha Co. No. 2	Lee	5-4	Late	Attractive	Rank	Closed
Jeff. Co. No. 10	Lee	8	Late	Average	Average	Open
Desha Co. No. 6	Lee	29-11	Late	Average	Average	Open
Jeff. Co. No. 12	Lee	14-3	Late	Average	Average	Open
Jeff. Co. No. 13	Lee	9-20	Late	Average	Short	Open

Table 2. Soybean Field Survey, 1965.

Field	Variety	Bollworm	Planting Date	Attractiveness	Plant Height	Type of Canopy
Lee Co. No. 3	Lee	0	Average	Average	Average	Closed
Arkansas Co. No. 1	Lee	0	Average	Average	Average	Open
Arkansas Co. No. 2	Lee	0	Average	Average	Average	Open
Lee Co. No. 1	Lee	1	Late	Very Attractive	Rank	Closed
Lee Co. No. 2	Lee	1	Average	Attractive	Rank	Closed
Jeff. Co. No. 1	Lee	1	Average	Attractive	Rank	Closed
Jeff. Co. No. 2	Lee	1	Average	Attractive	Rank	Closed
Monroe Co. No. 1	Lee	6-6	Average	Average	Rank	Open
Monroe Co. No. 2	Lee	6-9	Late	Attractive	Rank	Open
Jeff. Co. No. 3	Lee	8-3	Average	Average	Short	Open
Lee Co. No. 4	Lee	5-24	Very late	Attractive	Average	Open
Monroe Co. No. 3	Lee	11-5	Average	Average	Average	Open
Monroe Co. No. 4	Lee	10-2	Late	Average	Average	Open
Jeff. Co. No. 4	Lee	2-15	Late	Attractive	Average	Open
Lee Co. No. 5	Jackson	14-16	Average	Average	Rank	Open
Arkansas Co. No. 3	Jackson	2-4	Average	Average	Rank	Open
Lee Co. No. 6	Hood	1	Average	Average	Average	Closed
Arkansas Co. No. 4	Hood	0	Average	Average	Average	Closed
Lee Co. No. 7	Hill	1	Average	Average	Average	Closed
Monroe Co. No. 5	Ogden	1	Average	Average	Average	Closed

Table 3. Predaceous Bugs and Types of Canopy

County	Variety	Predaceous Bugs Average	Canopy
Arkansas No. 3	Jackson	77	Open
Arkansas No. 4	Hood	73	Closed
Arkansas No. 2	Lee	41	Closed
Lee No. 7	Hill	35	Closed
Lee No. 6	Hood	26	Closed
Lee No. 1	Lee	23	Closed
Arkansas No. 1	Lee	23	Open
Lee No. 3	Lee	21	Closed
Lee No. 2	Lee	19	Closed
Lee No. 4	Lee	16	Open
Monroe No. 1	Lee	13	Open
Monroe No. 5	Ogden	12	Closed
Jeff. No. 1	Lee	11	Closed
Monroe No. 4	Lee	11	Open
Lee No. 5	Jackson	9	Open
Jeff. No. 2	Lee	9	Closed
Monroe No. 3	Lee	9	Open
Jeff. No. 4	Lee	6	Open
Jeff. No. 3	Lee	4	Open
Monroe No. 2	Lee	3	Open

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